What did the community health worker do that was helpful? Perceptions from patients with type 2 diabetes

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Abstract

Background: Evidence supporting the effectiveness of community health worker (CHW) programs in improving type 2 diabetes mellitus (T2DM) outcomes is mixed. CHWs provide numerous activities; although, it is not clear what is effective or considered helpful by patients. This summative evaluation reports on patients' perspectives of CHW activities offered as part of a larger randomized controlled trial of a team-based diabetes-management program. **Methods:** Following one-year of access to CHW support, 192 racial/ethnic minorities with uncontrolled T2DM were provided a two-item summative evaluation that assessed how helpful they found the CHWs, on a ten-point scale, along with an open-ended question about specific activities they found most helpful. **Results:** Patients' mean age was 57 years, and 25% Hispanic/Latino, of which 47% preferred Spanish. The mean number of CHW visits was higher among Hispanics/Latinos compared to African-Americans (9.8, standard deviation [SD] 5.4 vs. 5.0, SD 4.7; $p<0.001$); however, perceived helpfulness was similar for both groups (Hispanic/Latinos 9.2, SD 1.5 vs. African-Americans 9.1, SD 1.9). Although the frequency of CHW visits was similar between Spanish- and English-speaking Hispanic/Latinos, the mean helpfulness rating was higher for Spanish-speakers than for English-speakers (9.6, SD 0.8 vs. 8.8, SD 1.8; $p=0.05$). After qualitative coding of the list of helpful activities, four major themes emerged: social support, health education, communication with the healthcare team and care coordination. **Conclusion:** This is among the first reports of differential CHW engagement within racial/ethnic groups. Additional research is needed to understand the relationship between CHW activities and mechanisms influencing outcomes.

Background

Community health workers (CHW) in the United States (US) fill a diverse set of roles, such as providing patient education and healthcare navigation along with connecting patients to community resources to address social determinants of health [1, 2]. The CHW profession now includes over 100 different job titles and is considered an official health profession by the Patient Protection and Affordable Care Act [3–5]. To date, 47 US states and the District of Columbia offer CHW support with reimbursement from various grant sources or Medicaid [6–8]. However, challenges exist.

Evidence supporting the impact of CHW interventions on type 2 diabetes mellitus (T2DM) is mixed [9–13]. While some studies found improvement in patients' diabetes knowledge and disease self-management [9, 11, 13], along with modest reductions in hemoglobin A1c (HbA1c) [12], others found no impact on outcomes [10]. Limitations included a lack of standardized CHW training, inconsistent CHW activities, and differing levels of CHW integration into the healthcare system [1, 14, 15]. This may relate to the fact that the scope of practice, training, and skills involved in serving as a CHW have not been well defined [16]. These variations in CHW intervention approaches limit the ability to understand the underlying pathways that might drive improvement in patients and prevents comparison across different CHW interventions [17].

Three published qualitative studies have explored the pathways through which CHWs might impact T2DM outcomes by asking patients what CHW roles they found most helpful [14, 18, 19]. The first assessed 25 African-American women's experiences with a CHW-delivered peer support program. Participants valued the social and emotional support provided by the CHW, along with the partnership and healthcare liaison CHWs offered [19]. The second purposefully sampled 47 Hispanic/Latino adults who noted CHWs provided encouragement, motivation, and helped build confidence. This was accomplished through an openness to hearing about the participants' diabetes and non-diabetes-related needs [14]. The third included 40 of 151 African-Americans and Hispanic/Latinos who participated in a CHW-led diabetes self-management program. Similar to the other studies, participants reported that CHWs provided them with knowledge and support that built their confidence to communicate with their healthcare providers along with providing non-judgmental assistance to work on their diabetes-related goals [18].

In terms of T2DM and CHW support, patients across studies identified similar roles and activities they found helpful such as motivation, confidence, and support. However, generalizability of the studies is limited due to small samples that were biased towards highly engaged patients. In addition, CHWs were all community-based as opposed to integrated into healthcare teams. Team-based healthcare models with CHW support are increasingly popular; however, patients' perspectives are sorely missing. Understanding the pathways through which CHW roles and activities drive improvements in outcomes is essential in developing cost-effective and sustainable diabetes-management programs [16, 18]. Among a sample of racial/ethnic minorities with uncontrolled T2DM, this analysis explored the CHW roles and activities patients identified as helpful. The CHWs support was delivered in the context of a randomized controlled trial of a team-based diabetes-management program.

Methods

Data for this report was collected within the context of a larger NIH-funded, randomized crossover trial of a team-based diabetes-management program. The team included a primary care physician, clinical pharmacist, and CHW hired within the healthcare system. All participants received primary care services and clinical pharmacy support for two years with the addition of CHW support randomized to one of those years [20]. Full details of the study design and primary outcomes are published elsewhere [22, 23]. This report focuses exclusively on the summative evaluation of patients' experiences with the CHWs.

Briefly, enrolled patients were required to have established primary care for at least one-year within the urban, academic medical center where the research was being conducted. Recruitment within the larger trial was conducted by experienced research assistants at patients' regularly scheduled clinic visits. Data for the current report was collected at the end of the year that patients worked with a CHW as part of the data collection in the larger study. The University of Illinois at Chicago Institutional Review Board approved all research.

CHW Training and Support Offered

Four women, two African-American and two bilingual native Spanish-speaking Latinas, served as full-time CHWs. CHWs were US citizens, had a bachelor's degree, and were experienced working in communities involved in the research. They had experienced the stress of caring for families with limited resources, dealing with discrimination, and many other barriers that patients similarly faced. Intensive standardized training over six weeks culminated in role playing assessments and continuing education throughout the study period. Standardized group training included two established educational curricula designed specifically for training CHWs and other lay individuals on diabetes: 1) Diabetes Empowerment Education Program (DEEP) [21]; and 2) Training Curriculum for Health Coaches [22]. The DEEP is a licensed program developed by the University of Illinois at Chicago, and adopted by the Centers of Medicare, to educate and empower low-income, racial/ethnic minorities on diabetes self-management. Through this manual-based, standardized program, CHWs were trained to help patients develop the skills and knowledge to manage their diabetes and prevent health complications. The health coach curricula, developed by Thomas Bodenheimer, director of the Center for Excellence in Primary Care at the University of California San Francisco, is a standardized training program for lay individuals that has been widely implemented [22]. Bodenheimer's curricula teaches the use of "Ask-Tell-Ask" communication with patients, collaborating with patients to formulate action plans and developing patients' problem-solving abilities, among other skills. Additional training included diabetes nutrition taught by a registered dietitian certified in diabetes education, and availability of hospital-based resources taught by a social worker. An endocrinologist and clinical pharmacists provided education on diabetes medications. Finally, CHWs spent several days shadowing the principal investigator in his primary care clinic, along with other providers, to increase their comfort within the clinical setting [23].

Each CHW managed 25 to 30 patients. A clinical health psychologist and primary care physician provided weekly supervision to the CHWs as a group. Multi-disciplinary supervision was required as many patients were quite ill with complex health needs and struggled with psychological issues. Additionally, CHWs shared valuable ideas, experiences and taught each other. Patients and CHWs were matched based on race/ethnicity and spoken language. The initial CHW contact focused on establishing a trusting, nonjudgmental relationship with the patient. Ongoing social and emotional support was a component of each visit. Education on diet, physical activity, medication management, smoking cessation, and availability of local community resources were tailored to each patients' interests or needs. Patients were informed that the CHW would support them in meeting their diabetes-related goals during home visits and phone calls provided over one-year. During that time, CHWs were also available to accompany patients to healthcare visits when patients desired this support, serving as advocates and role models. Following clinic visits, CHWs reinforced information from providers with patients. CHWs provided diabetes self-management support while identifying and addressing barriers for each patient. Therefore, the frequency of visits varied as did patient interest.

Summative Evaluation of CHWs

All participants who completed the final data collection for the larger trial were included in this report. Data were collected using in-person, interview-administered methods. A bilingual native Spanish-speaking Latina conducted data collection with all Hispanic/Latino patients and an African-American male collected data from African-American patients. Data collectors had over 10 years of experience conducting quantitative and qualitative interviews with vulnerable populations including formal training in mixed methods data collection.

The summative evaluation consisted of the following two questions:

“Think about the past 12 months since you first started working with your CHW. Think about the time you spent with her and about how helpful she may or may not have been. On a scale from 1 to 10, tell me how helpful she has been. 1 means not at all helpful and 10 means very helpful.”

“Did the CHW do anything that was helpful? If so, what? Please give me examples.” (The data collectors were told to try to elicit at least three responses to this open-ended question by using the prompt, “Anything else?”)

Responses were typed verbatim into Research Electronic Data Capture (REDCap) and exported to Microsoft Excel for coding.

Quantitative Data Analysis

Descriptive analysis was conducted on baseline demographics. Frequencies and proportions were used for categorical variables, and means (standard deviations [SDs]) for continuous variables. To identify differences between patients who met with a CHW and those who did not, Chi-square or Fisher’s exact tests were used for categorical variables. Two-sided t-tests were used for continuous variables. Data was analyzed using SAS 9.4 software.

Qualitative Data Analysis

The open-ended question assessing patients’ perceptions of helpful activities provided by the CHWs was coded using qualitative approaches. An experienced qualitative researcher (LKS) led the coding assisted by two research members with training in qualitative research methods (CHY, AR). The three coders developed an initial set of codes and definitions after reading the first twenty responses, following a thematic analysis approach to coding [24]. The three met to discuss application of the codes to the responses. Each member independently coded the first twenty responses and met to compare coding. A second set of twenty responses was independently coded prior to group discussion. Two team members (CHY, AR) independently coded the remaining data. Afterwards, all three team members met to review the coding and reach consensus. Final codes were organized into four broad themes that reflected areas of assistance provided by CHWs. These included: 1) social support, 2) health education, 3) care

coordination, and 4) enhanced communications with the healthcare team. Codes were summed as frequencies within each theme.

Results

All 192 patients who completed the data collection for the larger trial also responded to the summative evaluation on CHWs. The mean age was 57 years (range 26 to 92). Overall, 143 (75%) patients were African-American, and 49 (25%) were Hispanic/Latino, of which 23 (47%) indicated Spanish as their preferred language (Table 1). The mean time with T2DM was 13.5 years (SD 8.8).

Table 1 to be placed here

Perceived helpfulness of the CHW

The overall mean rating of helpfulness, on a scale from 1 to 10, was 9.1 (SD 1.8). African-Americans reported a mean of 9.1 (SD 1.9) and Hispanic/Latinos 9.2 (SD 1.5). However, amongst Hispanic/Latinos, CHW helpfulness was rated higher for Spanish- compared to English-speakers (9.6, SD 0.8 vs. 8.8, SD 1.8; $p = 0.05$).

Frequency of CHW visits

The overall mean number of CHW visits was 6.2 (SD 5.3). Hispanic/Latinos were significantly more likely to have met with a CHW at least once compared to African-Americans (98% vs. 76%; $p<0.001$) and had on average more CHW visits (9.8, SD 5.4 vs. 5.0, SD 4.7; $p<0.001$). However, amongst the Hispanic/Latino patients, frequency of CHW visits between Spanish- and English-speakers was comparable (10.8, SD 6.0 vs. 9.1, SD 4.7).

Patient-reported reasons for no CHW engagement

Thirty-five (18%) of the 192 patients who completed the survey reported having no CHW contact during the prior year. Stated reasons included scheduling conflicts ($n = 19$) and life stressors ($n = 3$). Thirteen patients provided no reasons. Most scheduling conflicts were due to work obligations, feeling overburdened with appointments, or experiencing difficulty connecting with the CHW. Most common life stressor was death of a loved one.

Types of CHW support that patients reported as helpful (Table 2)

Theme 1: Social support

The most common CHW role was social support which included providing moral support (n = 38), and motivation and encouragement (n = 86). CHWs were described as “being a good listener” and “giving good advice” on non-medical matters, such as life stressors or personal issues. As one patient stated, “[CHW] lifted me up when I was down. She talked and listened to me.” Another stated, “[CHW] listened to all my problems, especially my work issues which made it hard for me to come to my doctor appointment.” As reflected in this quote, “[CHW] made me feel like I could do anything, and she listened to me vent.” The relationship was motivating to some patients who felt that someone believed in them and cared about their progress on a personal level, as this was not something they received routinely from family and friends. Patients specifically appreciated the moral support offered during their clinic appointments and felt that their CHW advocated for them during these visits. Others mentioned that the encouragement and support to make healthier choices was invaluable. Several patients appreciated that the CHW joined them on walks during home visits. Some commented they felt that they were accepted by the CHW without fear of judgment as reflected in this quote, “...encouraged me to keep up good habits, [and] did not judge me when [my] sugars were high.”

Theme 2: Health education

The second most common CHW role was health education, which included providing and educating patients on direct services such as glucometer use and understanding blood pressure readings (n = 13), on health promotion and disease prevention (n = 68) and on self-management of disease (n = 84). Common topics included dietary changes, physical activity, and medication management. Patients expressed appreciation for the diabetes education despite many of them having lived with diabetes for decades. In particular, one patient said the CHW “taught me a lot of stuff I had forgotten over the 23 years of being diabetic. [It] was nice having a refresher course.” One patient found it helpful that the CHW told them “how to take [my] insulin; where to shoot and where not to.”

Other CHW support included working on goal setting, planning meals or suggesting realistic exercise options. One patient got help on “cutting back on smoking. We had a goal of one cigarette a day [and] I’m now at two a day.” Other patients reported the CHW educated them on diet and nutrition, such as recommending healthier recipes, food portion sizes or reading food labels. These resulted in weight loss for at least one patient who noted “with her [CHW] help, I lost 12lbs, and she helped me focus [by having] me write down everything I ate.”

Several patients mentioned that the CHW supported them in adhering to their medication regimens, such as setting an alarm on their smartphones, putting together a medication schedule for them, or calling them to check if they took their medications. Other patients appreciated when the CHW clarified their medication regimen or discussed their medication-related concerns.

Theme 3: Enhance communications with healthcare team

The third most common CHW role was building communications with the healthcare team. This included the CHW supporting patients at their pharmacist visits (n = 10) or physician visits (n = 16), and helping patients build their individual capacity (n = 52). Patients increased their capacity to interact with providers as a result of increased communication at many levels. Perhaps most fundamental, the 23 Spanish-speaking patients commented positively on the CHW serving as a language interpreter during visits with the pharmacists or providers. Several other patients mentioned that they appreciated the CHW joining them in their healthcare visits and helping them speak up to get their needs met. For example, one woman stated, “she [CHW] went beyond the call of duty. She went with me to my doctor’s visit when she didn’t have to [and] she made sure I got my questions answered.” Other examples were the CHW “helped me take notes at the pharmacy appointment” and another patient found it helpful that the CHW would “help me talk to the pharmacy about my medications when I had problems.” To foster these interactions, CHWs often assisted patients in preparing before visits so that they had a list of questions to ask providers.

Theme 4: Care coordination

The fourth CHW role was care coordination. This theme included comments suggesting that the CHW identified or connected the patients to resources, such as provided assistance in navigating the healthcare system (n = 2), advocated directly for basic needs (n = 7), performed case management responsibilities (n = 10) and addressed barriers to services (n = 20). Specifically, CHWs contacted providers to ask questions on behalf of the patient or helped obtain test results in addition to providing appointment reminders for patients. CHWs had access to the clinic nurses’ telephone numbers as well as providers’ paging numbers to use when necessary to connect patients to providers. In addition, patients appreciated that the CHWs helped them gain access to resources such as social work, arrange transportation, nutrition classes, and affordable community exercise programs. CHWs helped patients resolve issues with obtaining medications at their pharmacy, such as working with the pharmacist to look for lower cost medications. For example, a CHW helped a patient get their “insulin though my prescriptions was expired. She was able to call someone to give me three days’ worth of medication.” Another patient appreciated that the CHW “even went to pick up [their] medications” from the pharmacy when they were unable to find transportation.

Table 2 to be placed here

Discussion

Patients’ perceptions of CHW’s services were assessed within the context of an intervention that included one-year of CHW support offered to a low-income minority population with T2DM. The frequency of CHW contact intentionally varied based on the patient need and willingness. As a result, it was important to consider frequency of contact in understanding perceived helpfulness where a nuanced relationship emerged. Overall, patients that engaged with the CHWs found them to be very helpful as reflected by an average rating of 9.1 on a ten-point scale. Despite the fact that African-Americans had almost half the

number of CHW visits as Hispanic/Latinos overall, perceived helpfulness was comparable. Within the Hispanic/Latino group, Spanish-speakers perceived CHWs as slightly more helpful than the English-speakers, despite a comparable number of CHW visits. This difference in helpfulness may relate to the fact that CHWs often served as language interpreters for the Spanish-speakers during provider visits. Regardless, these appear to be novel findings as few, if any, prior studies have reported on differential CHW uptake across racial/ethnic groups or spoken language [18, 25, 26]. Our findings need to be explored in future studies to understand if these were spurious findings or if they can be replicated by others. The size of our sample was larger than most in this area which may have allowed differences to be detected [14, 18, 19].

In regard to the number of CHW visits, arguably, some patient needs can be met with less contact than other needs. For example, education on how to contact health care providers or obtaining glucometer testing supplies may be addressed in a limited number of CHW visits. Alternatively, coaching patients in goal attainment, addressing social isolation, or resolving care coordination services may require on-going contact. Furthermore, health education needs differed greatly between patients. However, it is not clear that these differ in any systematic way across racial/ethnic groups so as to explain the difference in CHW visits. In fact, no association was identified between patients' level of engagement and their perceptions of CHW activities or associations between racial/ethnic groups and types of helpful CHW activities.

If differential engagement with CHWs and perceptions of helpfulness across racial/ethnic and language groups are identified in other studies, it would be important to explore this further. Such knowledge may provide a more refined understanding of how CHWs help patients. For example, frequency of visits may be less important than having a motivated patient or a CHW who efficiently assesses patients' needs and addresses them. It is also plausible that some patients may simply require more CHW visits than others to reach similar outcomes. Understanding of the dynamics of CHW and patient relationships at this granularity is largely unexplored.

Patients' qualitative responses confirmed several CHW roles and aligned with findings of previous studies [14, 18, 19]. These activities included: providing social support, health education, care coordination, and building communication with the healthcare team. The impact of social support to improve health outcomes, especially in diabetes, is well documented, albeit poorly understood [27–29]. Social support is believed to be a fundamental component of the CHW model and is consistent with findings of other qualitative studies [14, 18, 19]. This was confirmed by patients' unprompted responses to our open-ended question. Several patients commented on the emotional support they received in response to experiencing the death of a loved one or other stressful life events while working with the CHW. Others described that having a trusting, nonjudgmental, and accepting advocate was a new experience that contributed to a renewed feeling of worth and self-confidence. Some mentioned they felt supported and encouraged to attend their health provider appointments when the CHW accompanied them. It is important to note that 45% of the patients did not mention social support. Perhaps some patients had sufficient social support or simply did not mention it because other activities were more valued. However, one must also consider that some individuals may be less able to use social support provided by a CHW

along with the possibility that CHWs may not effectively provide social support to everyone. The “fit” between the patient and the CHW may be important, although not often discussed outside of racial/ethnic or language concordance.

It is important to note that the CHW model did not work for everyone in the study. This is reflected by 35 (18%) patients not completing a single visit with their CHW and 9 patients with CHW engagement who reported a mean helpfulness of ≤ 5 with a mean of 3.8 (SD 4.1) CHW visits. As CHWs expand into clinical care, it is imperative to understand the factors associated with lack of engagement with CHW support. Many patients in our study reported that they did not have time to meet with their CHW. It is possible they saw the addition of a CHW in their diabetes care as another demand on their current work, family, social and/or health commitments. Understanding why certain patients do not engage in CHW-led diabetes management programs may suggest novel approaches designed to

Strengths and Limitations

This study involved a single urban, academic medical center that served predominantly lower income, minority patients. This limits generalizability of results. The number of CHW encounters varied across patients and may have influenced their experiences with their CHW in ways not captured. Furthermore, responses to the open-ended question may have been impacted by recall bias or varying levels of motivation to respond. There is potential for selection bias as only patients who returned for data collection in the large study completed the survey. Despite these limitations, this study provides support that many patients find CHW helpful in management of their diabetes. Unique to other studies, CHWs were integrated into a healthcare team. This is important as evidence demonstrates that CHWs’ patient care capacity is dependent on the support they receive from the healthcare systems and integrated CHW programs fosters communication between healthcare professionals [30]. In addition, this is the largest sample of patients’ perspectives on CHWs published to date with 192 patients, representing 79% of those enrolled in the larger study. This is also amongst the first to report findings from patients with few to no CHW engagement.

Conclusion

Low-income, minority patients with T2DM recognized that CHWs are helpful through social support, health education, care coordination and communication with the healthcare team. However, models of CHW support may not apply to all patients, and likely reflect the different perceived needs for support at the time of engagement with CHWs. Furthermore, in this study Latino/Hispanics were more engaged with CHWs than African-Americans. Additional research is needed to assess which specific CHW activities drive change in behaviors that improve clinical outcomes.

List Of Abbreviations

CHW: Community healthcare worker

US: United States

T2DM: Type 2 diabetes mellitus

HbA1c: hemoglobin A1c

DEEP: Diabetes Empowerment Education Program

SD: Standard deviations

Declarations

Ethics approval and consent to participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Illinois at Chicago Institutional Review Board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

BSG and LKS are co-principal investigators for this study. All authors contributed to design of study. CHY, AR, and LKS coded and analyzed all qualitative data. CHY and LKS drafted initial manuscript. All authors

participated in review and approval of the final manuscript.

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Tables

Table 1. Baseline patient characteristics and demographics (N=192)

	Did not meet with a CHW (n=35)	Met with a CHW (n=157)	All patients (n =192)
Age, years, mean (range)	59 (28 to 81)	57 (26 to 92)	57 (26 to 92)
Gender, n (%)			
Female	26 (74.3)	105 (66.9)	131 (68.23)
Male	9 (25.7)	52 (33.1)	61 (31.8)
Ethnicity/Race, n (%)			
African-American	34 (97.1)	109 (69.4)	143 (74.5)
Hispanic/Latino	1 (2.9)	48 (30.6)	49 (25.5)
Language spoken, n (%) *			
English	35 (100)	134 (85.4)	169 (88.0)
Spanish	0 (0.0)	23 (14.6)	23 (12.0)
Education, n (%)			
Less than high school	9 (25.7)	49 (31.2)	58 (30.2)
High school diploma or GED	18 (51.4)	71 (45.2)	89 (46.4)
2-year certificate or Associates	5 (14.3)	24 (15.3)	29 (15.1)
College graduate	3 (8.6)	11 (7.0)	14 (7.3)
Graduate degree	0 (0.0)	2 (1.3)	2 (1.0)
Household Income, n (%)†			
Less than \$10,000	13 (37.1)	53 (33.9)	66 (34.4)
\$10,000 - \$49,999	12 (32.3)	66 (42.0)	78 (40.6)
\$50,00 or more	4 (11.4)	15 (9.6)	19 (9.9)
Employment, n (%)†			
Work for pay	8 (22.9)	31 (19.7)	39 (20.3)
Unemployed	1 (2.9)	22 (14.0)	23 (12.0)
Retired	7 (20.0)	21 (13.4)	28 (14.6)
Disabled and unable to work	18 (51.4)	78 (49.7)	96 (50.0)
Marital Status, n (%)			

Single, never married	19 (54.3)	60 (38.2)	79 (41.2)
Married or living with partner	8 (22.9)	50 (31.9)	58 (30.2)
Widowed, separated, or divorced	8 (22.9)	47 (29.9)	57 (29.7)
Insurance, n (%)			
HMO/PPO	5 (14.7)	29 (18.5)	34 (17.8)
Medicare	8 (23.5)	27 (17.2)	35 (18.3)
Public Aid/Medicaid	17 (50.0)	97 (61.8)	114 (59.7)
Uninsured	4 (11.8)	4 (2.6)	8 (4.2)
Self-rated health status, n (%)			
Excellent/ Very good	3 (8.6)	8 (5.1)	11 (5.7)
Good	16 (45.7)	48 (30.6)	64 (33.3)
Fair	15 (42.9)	80 (51.0)	95 (49.5)
Poor	1 (2.9)	21 (13.4)	22 (11.5)

† Numbers are less than 100% due to refuse to answer or missing data

* Statistically significant at $p < 0.05$ (Fisher's exact test)

Table 2. Frequency and examples of patient responses regarding perceived helpful CHW roles and activities

Social support, <i>n</i> (%)	All patients (n=192)	Example patient responses
Provide moral support and coaching	86 (44.8)	<p><i>"She listened to all my problems, my work's issues which made it hard for me to come to my doctor appointment."</i></p> <p><i>"Having the support of a community health [worker] is very beneficial especially if you don't have support from family and friends. For example, just making a call helps a lot."</i></p>
Motivate and encourage individual	38 (19.8)	<i>"She got on me about diabetes because I was not doing right. She was really concerned and I showed her I could do better."</i>
Health education, <i>n</i> (%)		
Support self-management or disease prevention and management	84 (43.8)	<p><i>"She talk to me and work with me to come up with a plan to control my diabetes, such as eating right and exercising and taking meds..."</i></p> <p><i>"She broke it down on what to do to help my diabetes."</i></p>
Health promotion and disease prevention education	68 (35.4)	<i>"She really talk to me about cutting back on smoking and with eating better. We had a goal of one cigarette a day. I'm at two a day."</i>
Provide and educate individual on direct services	13 (6.8)	<p><i>"She start alarm on phone to take my meds so I will not forget."</i></p> <p><i>"She help me use blood pressure machine..."</i></p>
Building Communication, <i>n</i> (%)		
Building individual or community capacity	52 (27.1)	<i>"She went beyond the call of duty; she went to my doctor visits when she didn't really have to. Very involved with my healthcare,"</i>
Support patient-physician communication at visits	16 (8.3)	<i>"She has helped me with everything like interpreting me in pharmacy or with the doctor."</i>
Support patient-pharmacist communication at visits	10 (5.2)	<i>"She helped me with my medications and talked to the pharmacy about my medications that I must take."</i>
Care Coordination, <i>n</i> (%)		
Address barriers to services	20 (10.4)	<p><i>"Ask me about my concerns about my treatment here at UIC."</i></p> <p><i>"She helped me get my insulin as my prescriptions was expired. She was able to call someone to give me three days' worth of medication"</i></p>
Care coordination and/or case management	10 (5.2)	<i>"She helped with getting strips, help with medications, help with getting in contact with nurses and doctors."</i>

Connect to resources and advocate for basic needs	7 (3.6)	<i>"She brought me exercising DVD and information."</i> <i>"She gave me some resources to help me for nutrition and exercises."</i>
Navigation of health and social service systems	2 (1.0)	<i>"She helped get me in touch with social worker."</i>